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(54) Title: LETTER INPUT DEVICE, MOBILE TELEPHONE SYSTEM HAVING SAME, AND INPUT CONTROL METHOD THEREOF

1 QZ	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PRS	8 TUV	9 WXY

(57) Abstract: Disclosed is a letter input device which comprises: a keyboard for assigning a sequent order of a predetermined number of English letters input by using a single key; and a controller for controlling to display an English letter corresponding to an input by a sequent order key and an input by a key that has a plurality of English letters, the keys being provided on the keyboard. The keyboard comprises: a control key for selecting a function of the letter input device; and an English letter key unit including a sequent order key and an English letter key to which a plurality of English letters are provided. The controller receives inputs generated by the sequent order key and inputs generated by the key that has a plurality of the English letters, and controls to display an English letter corresponding to the sequent order among the English letters. The controller controls to display a first English letter among the English letters when an input by an English letter key is provided without an input by the sequent order key.

Letter Input Device, Mobile Telephone System having Same, and Input Control Method thereof

5

BACKGROUND OF THE INVENTION

(a) Field of the Invention

The present invention relates to a letter input device, a mobile telephone system and an input control method thereof. More specifically, the present invention relates to a letter input device, a mobile telephone system and an input control method thereof for conveniently inputting English letters using a dialing button of a wireless telephone, a mobile telephone and a wire telephone.

(b) Description of the Related Art

Recently, portable information terminals (referred to as mobile telephones hereinafter) have become widely spread as the necessities of life, and users have become varied to older and younger persons.

Mobile communication service providers provide various services such as a message transmission service, a mailing service and an Internet service to the users.

20 Since it is very important to reduce the size of the mobile telephone, it is not desirable to increase the number of keys of a dialing keyboard unlimitedly.

Therefore, in the conventional methods, the number keys of the dialing keyboard are designed to have multi key functions by combining the Korean and English on the number keys and reducing the number of the

25

keys.

A conventional letter input device comprises a keyboard on which a plurality of keys respectively having a scan code is provided; a micro computer for scanning the keyboard; and a key code buffer for storing at least one key code data and one key code. The micro computer reads scan codes and outputs ASCII codes according to a built-in program, and provides the scan codes and ASCII codes via the key code buffer.

Referring to drawings, a conventional letter input device will now be described.

FIG. 1 shows a general arrangement state of number keys of a dialing keyboard.

As shown, the ten number keys of the dialing button of the telephone respectively enable to input three English and Korean letters, a control key, an asterisk and a pound sign. For ease of illustration, the Korean letters and other function keys are not illustrated in FIG. 1.

A user dials a telephone number via the ten number keys on the dialing keyboard and assigns a predetermined service and calls the same via the control key. In order to input the English letters on the dialing keyboard, the English letters are arranged together with the nine number keys in a superimposed manner. Hence, the user can input the 26 English letters using the dialing key buttons.

The letter input device of the dialing keyboard must refer to the key combinations of FIG. 2 so as to recognize the English letters superimposed

on the dialing key buttons of FIG. 1 in a letter input mode.

As shown in the key combinations of FIG. 2, a single stroke of a number 2 key must be provided to input a letter 'A', double strokes of the number 2 key to input a letter 'B', and triple strokes of the number 2 key to
5 input a letter 'C'.

Also, in order to input a word 'ABC', a single stroke of the number 2 key, a pause, double strokes of the number 2 key, a pause and triple strokes of the number 2 key must be provided.

When the pause is provided to the micro computer, the micro
10 computer checks the key combination previously input to the number 1 key, and sequentially stores corresponding English ASCII codes in the key code buffer. The above-described key input method has low efficiency, and since each letter combination has a predetermined number of the pause, a time of inputting the letters are increased.

15 In the case the English letter input device support English upper and lower cases, when the user desires to input the English lower cases, the user must press a predetermined control key to convert the upper case input mode into the lower case input mode, and thereby generating greater problems.

20

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a letter input device,

a mobile telephone having the same, and its input control method for quickly inputting the English letters via keys.

In one aspect of the present invention, in a letter input device for inputting letters with a predetermined number of number keys and letter keys,
5 a letter input device comprises: a keyboard for assigning a sequent order of a predetermined number of English letters input by using a single key; and a controller for controlling to display an English letter corresponding to an input by a sequent order key and an input by a key that has a plurality of English letters, the keys being provided on the keyboard.

10 The keyboard comprises: a control key for selecting a function of the letter input device; and an English letter key unit including a sequent order key and an English letter key to which a plurality of English letters are provided.

The controller receives inputs generated by the sequent order key
15 and inputs generated by the key that has a plurality of the English letters, and controls to display an English letter corresponding to the sequent order among the English letters.

The controller controls to display a first English letter among the English letters when an input by an English letter key is provided without an
20 input by the sequent order key.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and

constitute a part of the specification, illustrate an embodiment of the invention, and, together with the description, serve to explain the principles of the invention:

FIG. 1 shows a general arrangement state of number keys of a
5 dialing keyboard;

FIG. 2 shows a key combination of a conventional dialing keyboard;

FIG. 3 shows a schematic diagram of a mobile telephone having a letter input device according to a preferred embodiment of the present invention;

10 FIG. 4 shows a first preferred embodiment of an English letter key unit of the letter input device according to the preferred embodiment of the present invention;

FIG. 5 shows a key input order for inputting English lower cases of the first preferred embodiment of the English letter key unit of the letter input
15 device according to the preferred embodiment of the present invention;

FIG. 6 shows a key input order for inputting English upper cases of the first preferred embodiment of the English letter key unit of the letter input device according to the preferred embodiment of the present invention;

FIG. 7 shows a second preferred embodiment of an English letter
20 key unit of the letter input device according to the preferred embodiment of the present invention;

FIG. 8 shows a third preferred embodiment of an English letter key unit of the letter input device according to the preferred embodiment of the

present invention;

FIG. 9 shows a fourth preferred embodiment of an English letter key unit of the letter input device according to the preferred embodiment of the present invention;

5 FIG. 10 shows a fifth preferred embodiment of an English letter key unit of the letter input device according to the preferred embodiment of the present invention;

FIG. 11 shows a sixth preferred embodiment of an English letter key unit of the letter input device according to the preferred embodiment of the
10 present invention;

FIG. 12 shows a key input order for inputting English upper cases of the sixth preferred embodiment of the English letter key unit of the letter input device according to the preferred embodiment of the present invention;

FIG. 13 shows a key input order for inputting English lower cases of
15 the sixth preferred embodiment of the English letter key unit of the letter input device according to the preferred embodiment of the present invention;

FIG. 14 shows a seventh preferred embodiment of an English letter key unit of the letter input device according to the preferred embodiment of the present invention; and

20 FIGs. 15 to 17 show tables of comparing the key input numbers for inputting the English letters using the conventional dialing keyboard and the letter input device according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following detailed description, only the preferred embodiment of the invention has been shown and described, simply by way of illustration of the best mode contemplated by the inventor(s) of carrying out the invention. As will be realized, the invention is capable of modification in various obvious respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not restrictive.

FIG. 3 shows a schematic diagram of a mobile telephone having a letter input device according to a preferred embodiment of the present invention.

As shown, the mobile telephone comprises an antenna 20 for wirelessly receiving a predetermined signal from a base station; a keyboard 50 including an English letter key unit 52 for assigning a plurality of English letters to respective keys and assigning a function for setting an order of the English letters to remaining keys; a controller 10 for controlling displaying of English letters corresponding to inputting of sequent order keys and inputting of keys that respectively have a plurality of English letters; a speaker 30 for outputting a voice as a bell sound; and a display 60 for displaying data according to control of the controller 10.

Referring to FIGs. 3 to 17, an operation of a mobile telephone having a letter input device according to a preferred embodiment of the present invention will now be described in detail.

First, when the power is supplied, the mobile telephone that has a letter input device starts to be operated.

After the start of the operation, when a user manipulates a control key 51 to access the Internet or send a short message, a micro computer 12
5 recognizes the manipulation, switches the input states to a corresponding mode, and enables the corresponding letters to be displayed on the display 60.

That is, when the user uses the control key 51 to switch a previous mode into an English letter input mode, the micro computer 12 switches the
10 input state into the English letter input mode, and enables the corresponding letters to be displayed on the display 60.

In this instance, the control key 51 can be located in various ways, and can select various additional services such as a power on/off function, a letter input mode switching function and a short message selection function,
15 and if needed, some portions of the additional services can be provided to the English letter key unit.

In this state, when the user presses a sequent order key and a corresponding English letter key of the English letter key unit 52, the micro computer 12 displays an English letter corresponding to the corresponding
20 sequent order among the two or three English letters corresponding to the corresponding English letter key on the display 60.

After the input of the English letter, when the user uses the control key to input an instruction signal for transmitting a letter stream, the micro

computer 12 wirelessly transmits the corresponding letter stream via the transmitter and receiver 13 and the antenna 20.

Here, a process for inputting the English letter will now be described in detail. In order to input the English letters, respective input sequent order
5 functions are provided to the asterisk (*) key, zero (0) key and the pound sign (#) key that have no English letter, and by combining the input sequent order keys with the English letter keys, the upper cases and the lower cases of the 26 English alphabets can be input.

The input sequent order functions provided to the asterisk key, zero
10 key and the pound sign key are as follows.

The asterisk key has a shift function for dividing the upper cases and the lower cases and inputting the same, and also has a sequent order canceling function for setting the sequent order previously assigned as the second or the third order as a default order, that is, the first order.

15 The number zero key sets the sequent order of the English letter as the second order, and the pound sign key as the third order.

FIG. 4 shows a first preferred embodiment of an English letter key unit of the letter input device of a mobile telephone according to the preferred embodiment of the present invention.

20 As shown in FIG. 4, the most important feature of the English letter key unit 52 is that the sequent order keys (the asterisk key, the number zero key and the pound sign key) for assigning what order of the English letter among the two or three English letters provided on the English letter keys 1

to 9 will be input are provided to the English letter key unit 52.

Also, the asterisk sign indicates an upper case and lower case input mode. The asterisk key resets the previous second or third sequent order to the default value, that is, the first order.

5 In the English letter key unit 52, the shift function for dividing the upper cases and the lower cases and inputting the same and an English letter sequent order canceling function are assigned to the asterisk key, a function for inputting a second letter among the English letters provided on the respective keys is assigned to the number zero key, and a function for
10 assigning the third letter is provided to the pound sign key.

The micro computer 12 generates 26 upper cases and 26 lower cases and displays the same on the display 60 via the inputs of the sequent order keys and the English letter keys. Here, the Korean letters and the numbers can be input using the English letter key unit 52 according to the
15 selection by the control key 51.

FIG. 5 shows a table for inputting the English lower cases using the English letter key unit 52.

As shown in FIG. 5, the English lower cases are easily input using the sequent order keys and the English letter keys, and there is no need to
20 press the sequent order keys when inputting the first English letter of the English letters printed on the respective English letter keys 1 to 9.

FIG. 6 shows a table for inputting the English upper cases. The upper cases are easily input using the upper case assigning key (*), the

sequent order keys (*, 0 and #) and the English letter keys 1 to 9, and there is no need to press the sequent order keys when inputting the first English letter of the English letters printed on the respective English letter keys 1 to 9.

At this time, the input methods can be varied, and an order of the
5 upper case key (*) and the sequent order keys (*, 0 and #) can be changed.

FIG. 7 shows a second preferred embodiment of the English letter key unit. The (2) and (3) which are printed on the sequent order keys, that is, the number zero key and the pound sign key and respectively represent corresponding orders are printed as 2nd and 3rd. They have identical functions,
10 and a preferred embodiment of inputting the English letters is identical with that of the first preferred embodiment as shown in FIGs. 5 and 6.

Also, the notation of 2nd and 3rd can be replaced with 2th and 3th.

Here, the SHC printed on the asterisk key represents a combined word of 'shift' with 'cancel' for changing the upper case and the lower case
15 and canceling the sequent order assignment.

FIG. 8 shows a third embodiment of the English letter key unit. Since the third embodiment does not support the function of changing the upper case and the lower case, only the function of sequent order canceling is printed on the asterisk key. The third preferred embodiment can be applied
20 to a cheap mobile telephones. Since the inputting of English lower cases is removed, only the upper cases as shown in FIG. 6 are used. Or, the third embodiment can only support the lower cases.

FIG. 9 shows a fourth embodiment of the English letter key unit. The

notations (2) and (3) are removed on the assumption that the user can implicitly know the sequent order function without further notation on them, and the function of the fourth embodiment is identical with that of the first embodiment. An example of inputting the English letters is shown in FIGs. 5 and 6 in the like manner of the first preferred embodiment.

FIG. 10 shows a fifth embodiment of the English letter key unit. Differing from the first preferred embodiment, the second sequent order function is assigned to the asterisk key, the third sequent order function to the number zero key, and the English upper case and lower case changing function and the sequent order assignment canceling function to the pound sign key.

FIG. 11 shows a sixth embodiment of the English letter key unit. In the six embodiment, three or four English letters are provided on a single English letter key. In this case, the notation of (3/4) is printed on the pound sign key, and accordingly, when the user presses the pound sign key once, the third arranged English letter is input, and when the user presses the pound sign key twice with no pause, the fourth English letter is input.

FIG. 12 shows a key input order of a table for inputting the upper cases of the sixth preferred embodiment.

As shown in FIG. 12, when the user presses the number 1 key for assigning the upper case and presses the sequent order key and the English letter key on which a corresponding English letter is printed, the corresponding English upper-case letter is input.

FIG. 13 shows a table of a key input order for inputting the English lower cases of the sixth embodiment of the English letter key unit.

As shown in FIG. 13, when the user presses the sequent order key and the English letter key on which the corresponding English letter is
5 printed, the corresponding English lower-case letter is input.

FIG. 14 shows a seventh embodiment of the English letter key unit. Since the alphabet order assignment key is provided on the left buttons, the seventh embodiment is convenient when the user uses his both hands to input the letters. Since the user uses the both hands, the user can more
10 quickly input the letters.

In case of need, the input order of the above-described upper cases and the lower cases can be modified.

FIGs. 15 to 17 show results for comparing the key input number of times in the case of inputting the English letters using the English letter key
15 unit according to the present invention with that according to the conventional dialing keyboard.

As shown in FIGs. 15 to 17, the present invention reduces the key input number of times to almost a half of the number of times.

The present invention can be applied to bi-directional wireless
20 communication devices, other electronic appliances and computers that have English letter input functions as well as the mobile telephone.

According to the present invention, unnecessary key input steps are reduced and the pause period is removed, and therefore, the user can

quickly input desired English letters.

While this invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not limited to the disclosed
5 embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

WHAT IS CLAIMED IS:

1. In a letter input device for inputting letters with a predetermined number of number keys and letter keys, a letter input device comprising:

a keyboard for assigning a sequent order of a predetermined
5 number of English letters input by using a single key; and

a controller for controlling to display an English letter corresponding to an input by a sequent order key and an input by a key that has a plurality of English letters, the keys being provided on the keyboard.

2. The device of claim 1, wherein the keyboard comprises:

10 a control key for selecting a function of the letter input device; and
an English letter key unit including a sequent order key and an English letter key to which a plurality of English letters are provided.

3. The device of claim 2, wherein the controller receives inputs generated by the sequent order key and inputs generated by the key that
15 has a plurality of the English letters, and controls to display an English letter corresponding to the sequent order among the English letters.

4. The device of claim 3, wherein the controller controls to display a first English letter among the English letters when an input by an English letter key is provided without an input by the sequent order key.

20 5. A mobile telephone comprising:

an antenna for wirelessly receiving a predetermined signal from a base station;

a display for displaying data;

a keyboard for assigning a sequent order of a predetermined number of English letters input by a single key; and

a controller for controlling the English letter corresponding to an input by a sequent order key and an input by a key that has a plurality of English letters, so as to be displayed on the display, the keys being provided on the keyboard.

6. The mobile telephone of claim 5, wherein the keyboard comprises:

a control key for selecting a function of a letter input device; and
an English letter key unit including a sequent order key and an English letter key to which a plurality of English letters are provided.

7. The mobile telephone of claim 6, wherein the controller receives inputs generated by the sequent order key and inputs generated by the key that has a plurality of the English letters, and controls to display an English letter corresponding to the sequent order among the English letters.

8. In an input control method of a letter input device for inputting English letters via a keyboard including a first predetermined number of keys, a method for controlling a letter input device comprising:

assigning sequent order keys for assigning an order of a second predetermined number of English letters provided to a single key of the keyboard as many as the number of the second predetermined number; and
generating a single English letter and displaying the same according to sequential inputs by the sequent order key for setting the order

and by a key for selecting an English letter.

9. The method of claim 8, wherein when an input by the sequent
order key and an input by a key that has a plurality of English letters are
provided, an English letter that corresponds to the sequent order among the
5 English letters is displayed, and when no input by the sequent order key is
provided, a first English letter is provided.

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FIG.1

1 .QZ	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PRS	8 TUV	9 WXY

FIG.2

English letter	Input Key	English letter	Input Key	English letter	Input Key	English letter	Input Key
A	2	H	44	O	666	V	888
B	22	I	444	P	7	W	9
C	222	J	5	Q	11	X	99
D	3	K	55	R	77	Y	999
E	33	L	555	S	777		
F	333	M	6	T	8		
G	4	N	66	U	88		

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FIG.3

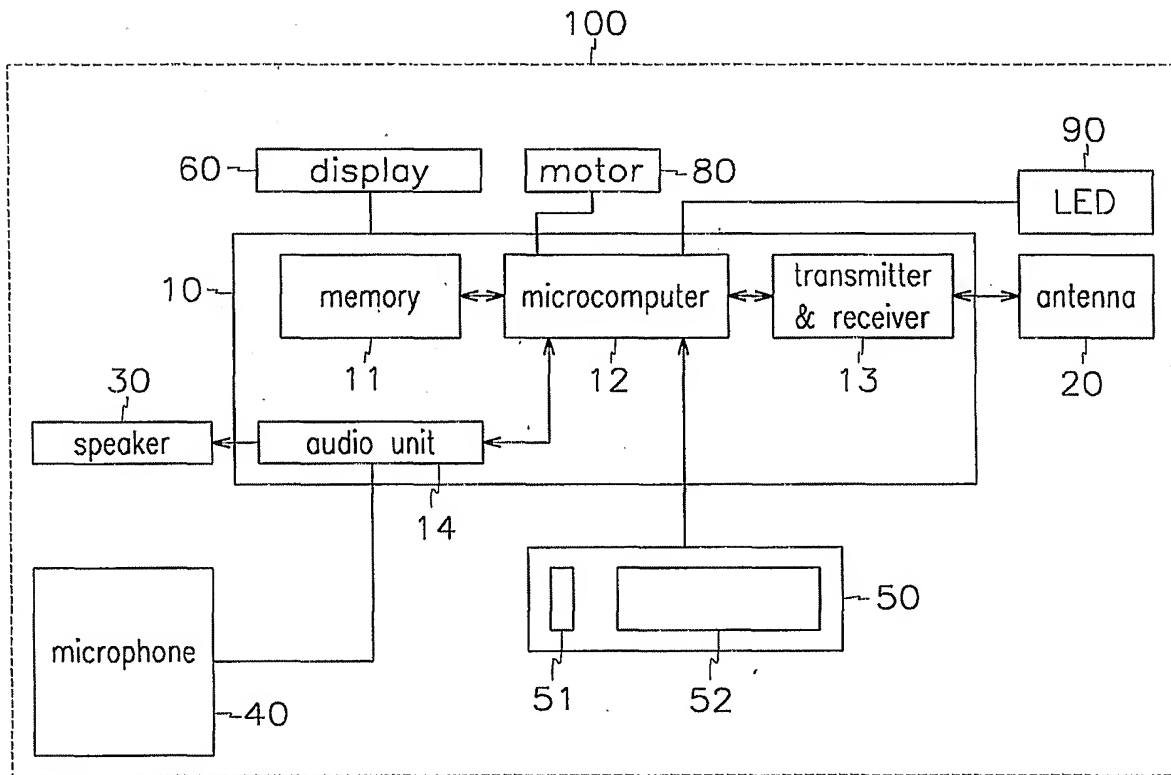


FIG.4

1	2	3
.QZ	ABC	DEF
4	5	6
GHI	JKL	MNO
7	8	9
PRS	TUV	WXY
*	0	#
(SHC)	(2)	(3)

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FIG.5

English letter	Input key	English letter	Input key
a	2	A	* 2
b	0 2	B	* 0 2
c	# 2	C	* # 2
d	3	D	* 3
e	0 3	E	* 0 3
f	# 3	F	* # 3
g	4	G	* 4
h	0 4	H	* 0 4
i	# 4	I	* # 4
j	5	J	* 5
k	0 5	K	* 0 5
l	# 5	L	* # 5
m	6	M	* 6
n	0 6	N	* 0 6
o	# 6	O	* # 6
p	7	P	* 7
q	0 1	Q	* 0 1
r	0 7	R	* 0 7
s	# 7	S	* # 7
t	8	T	* 8
u	0 8	U	* 0 8
v	# 8	V	* # 8
w	9	W	* 9
x	0 9	X	* 0 9
y	# 9	Y	* # 9
z	# 1	Z	* # 1

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FIG.6

English letter	Input key	English letter	Input key
a	* 2	A	2
b	* 0 2	B	0 2
c	* # 2	C	# 2
d	* 3	D	3
e	* 0 3	E	0 3
f	* # 3	F	# 3
g	* 4	G	4
h	* 0 4	H	0 4
i	* # 4	I	# 4
j	* 5	J	5
k	* 0 5	K	0 5
l	* # 5	L	# 5
m	* 6	M	6
n	* 0 6	N	0 6
o	* # 6	O	# 6
p	* 7	P	7
q	* 0 1	Q	0 1
r	* 0 7	R	0 7
s	* # 7	S	# 7
t	* 8	T	8
u	* 0 8	U	0 8
v	* # 8	V	# 8
w	* 9	W	9
x	* 0 9	X	0 9
y	* # 9	Y	# 9
z	* # 1	Z	# 1

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FIG. 7

1 .QZ	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PRS	8 TUV	9 WXY
* (SHC)	0 (2nd)	# (3rd)

FIG. 8

1 .QZ	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PRS	8 TUV	9 WXY
* (C)	0 (2)	# (3)

FIG. 9

1 .QZ	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PRS	8 TUV	9 WXY
*	0	#

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FIG.10

1 .QZ	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PRS	8 TUV	9 WXY
* (2)	0 (3)	# (SHC)

FIG.11

1 (SHC)	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
* .	0 (2)	# (3/4)

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FIG.12

English letter	Input key	English letter	Input key
a	1 2	A	2
b	1 0 2	B	0 2
c	1 # 2	C	# 2
d	1 3	D	3
e	1 0 3	E	0 3
f	1 # 3	F	# 3
g	1 4	G	4
h	1 0 4	H	0 4
i	1 # 4	I	# 4
j	1 5	J	5
k	1 0 5	K	0 5
l	1 # 5	L	# 5
m	1 6	M	6
n	1 0 6	N	0 6
o	1 # 6	O	# 6
p	1 7	P	7
q	1 0 7	Q	0 7
r	1 # 7	R	# 7
s	1 # # 7	S	# # 7
t	1 8	T	8
u	1 0 8	U	0 8
v	1 # 8	V	# 8
w	1 9	W	9
x	1 0 9	X	0 9
y	1 # 9	Y	# 9
z	1 # # 9	Z	# # 9

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FIG.13

English letter	Input key	English letter	Input key
a	2	A	1 2
b	0 2	B	1 0 2
c	# 2	C	1 # 2
d	3	D	1 3
e	0 3	E	1 0 3
f	# 3	F	1 # 3
g	4	G	1 4
h	0 4	H	1 0 4
i	# 4	I	1 # 4
j	5	J	1 5
k	0 5	K	1 0 5
l	# 5	L	1 # 5
m	6	M	1 6
n	0 6	N	1 0 6
o	# 6	O	1 # 6
p	7	P	1 7
q	0 7	Q	1 0 7
r	# 7	R	1 # 7
s	# # 7	S	1 # # 7
t	8	T	1 8
u	0 8	U	1 0 8
v	# 8	V	1 # 8
w	9	W	1 9
x	0 9	X	1 0 9
y	# 9	Y	1 # 9
z	# # 9	Z	1 # # 9

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FIG.14

1 QZ	2 ABC	3 DEF
4 (3)	5 GHI	6 JKL
7 (2)	8 MNO	9 PRS
* (SHC)	0 TUV	# WXY

FIG.15

	Joe	input numer of times	input time frame
converntional dialing keyboard	[Upper case mode key]+ 5key + no input for a predetermined time + [Lower case mode key] + 2key + no input for a predetermined time + 3key + 3key + no input for a predetermined time	9times	long
present invention	*key + 5key + 2key + 0key + 3key	5times	short

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FIG.16

	www.han.co.kr	input number of times	input time frame
conventional dialing keyboard	9key + no input for a predetermined time + 9key + no input for a predetermined time + 9key + no input for a predetermined time + 1key + no input for a predetermined time + 4key + 4key + no input for a predetermined time + 2key + no input for a predetermined time + 6key + 6key + 1key + no input for a predetermined time + + 2key + 2key + 2key + no input for a predetermined time + 1key + no input for a predetermined time + 5key + 5key + no input for a predetermined time + 7key + 7key + no input for a predetermined time	34times	long
present invention	9key + 9key + 9key + 1key + 0key + 4key + 2key + 0key + 6key + 1key + #key + 2key + #key + 6key + 1key + 0key + 5key + 0key + 7key	19times	short

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FIG.17

	www.han.co.kr	input number of times	input time frame
conventional dialing keyboard	<p>7key + 7key + no input for a predetermined time + 8key + no input for a predetermined time + 8key + 8key + no input for a predetermined time + 3key + no input for a predetermined time + 3key + 3key + no input for a predetermined time + 6key + 6key + no input for a predetermined time + 8key + no input for a predetermined time</p>	19times	long
present invention	<p>#key + 7key + 8key + 0key + 8key + 3key + 0key + 3key + 0key + 6key + 8key</p>	11times	short